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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/787,305 | 02/27/2004 | Mitsuharu Sawamura | 03500.017924. | 4345 |
| 5514 | 7590 | 11/03/2004 | EXAMINER | |
| FITZPATRICK CELLA HARPER & SCINTO | | | AMARI, ALESSANDRO V | |
| 30 ROCKEFELLER PLAZA | | | ART UNIT | |
| NEW YORK, NY 10112 | | | PAPER NUMBER | |
| | | | 2872 | |

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/787,305

Applicant(s)

SAWAMURA ET AL.

Examiner

Alessandro V. Amari

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/27/04 & 4/1/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the TiO₂ film contacting the reflection mirror in claim 3 and the additional protective layer of SiO_x in claim 7 and the sequence of layers recited in claims 8 and 9 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 3, 8 and 9 are objected to because of the following informalities:

Regarding claim 3, lines 2-3, the recitation of "a film of the underlying layer contacting the reflection mirror" is ambiguous and confusing since the film of the underlying layer comprises part of the reflection mirror.

Claims 8 and 9 appear to claim various alternative arrangements for the underlaying and protective layers. However, the format used for these Markush groups is improper. See MPEP 2173.05(h).

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bayer et al US 4,522,862 in view of Fujii US 5,583,704.

In regard to claim 1, Bayer et al discloses (see for example, Figures 4a, 4b) a reflection mirror comprising a substrate (53) an underlaying layer (54, 55, 56, 57) formed on the resin substrate, the underlaying layer including at least one TiO₂ film and at least one Al₂O₃ film as described in column 9, lines 56-68 and column 10, lines 1-5, wherein a film of the underlaying layer contacting the resin substrate is a TiO₂ film as described in column 9, lines 56-68 and column 10, lines 1-5; a reflection layer (58)

Art Unit: 2872

composed of an Ag film formed on the underlaying layer; and a protective layer (59, 60, 61, 62) formed on the reflection layer, the protective layer including at least one TiO₂ film and at least one Al₂O₃ film as described in column 9, lines 56-68 and column 10, lines 1-5. Regarding claim 2, Bayer et al discloses that each of the underlaying layer and the protective layer is composed of alternate layers of a TiO₂ film and an Al₂O₃ film as described in column 9, lines 56-68 and column 10, lines 1-5. Regarding claim 3, Bayer et al discloses that a film of the underlaying layer contacting the reflection mirror is a TiO₂ film as described in column 9, lines 56-68 and column 10, lines 1-5.

Regarding claim 8, Bayer et al teaches the claimed layers for the underlaying layer as shown in Figures 4a and 4b. Regarding claim 9, Bayer et al teaches the claimed layers for the protective layer as shown in Figures 4a and 4b.

However, in regard to claim 1, Bayer et al does not teach a resin substrate or regarding claim 10 and 11 that the optical member comprising the reflection mirror which is further used in optical equipment.

Regarding claim 1, Fujii teaches that the substrate is a resin substrate as described in column 4, lines 1-5. Regarding claims 10 and 11, Fujii does teach an optical member comprising the reflection mirror which is further used in optical equipment as described in column 1, lines 19-26.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the resin substrate of Fujii in the reflection mirror of Bayer et al in order to provide for a more resilient backing and thus improved durability for the mirror.

Regarding claims 4-6, Bayer et al in view of Fujii teaches the claimed invention except for the claimed thickness ranges for the TiO₂ and Al₂O₃ films. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the ranges, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to adjust the thickness ranges for the purpose of improving the reflectivity of the mirror. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bayer et al US 4,522,862 in view of Fujii US 5,583,704 and further in view of Gillich et al US 6,709,119.

Regarding claim 7, Bayer et al in view of Fujii teaches the invention as set forth above but does not teach that the protective layer further includes a film of SiO_x ($1 < x < 2$) having a geometric film thickness of 1 to 20 nm.

Regarding claim 7, Gillich et al teaches that the protective layer further includes a film of SiO_x ($1 < x < 2$) having a geometric film thickness of 1 to 20 nm as described in column 1, lines 57-67.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the protective layer as taught by Gillich et al in the mirror of Bayer et al in view of Fujii in order to provide for a reflector which is less sensitive to external mechanical stresses as described in column 1, lines 57-61.

Art Unit: 2872

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (571) 272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ava *any*
29 October 2004


MARK A. ROBINSON
PRIMARY EXAMINER